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Sixth Sense on Personal Assistant

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ABSTRACT

Paper focuses on designing and developing an user interface to help out the dumb community in making a better use of the personal assistance devices such as Amazon Echo, Alexa etc. It mainly deals with making services of the personal assistance to be easily accessible by the dumb community using sign languages. This web design is based on data science collected from standards of Indian Sign Languages (ISL) and can be built using machine learning tools. TensorFlow library is used as the machine learning package. Sixth sense on personal assistance project is implemented in Anaconda software using python language. Implementation can be done in 3 phases. First phase involving design of the GUI for end user to scan the user image, the second phase deals with implementation of machine learning algorithms to categorize the uploaded article and third phase involves the displaying of categorized results. By using keyword extraction algorithm with category classification and topic discovery algorithm. The results of the project is a software which efficiently reads the users sign languages and converts it into user defined languages which is easily understandable by the personal assistance tools. Maintenance and further development of application as well as the feedback provided by the end users is encouraged.

Keywords: Tensorflow, Squeeze net and Indian Sign Language.

I. INTRODUCTION

Every personal assistance is useful for people who can use voice as their input, but these types of personal assistance cannot be used by the people who cannot speak. There have been countless articles popping up about personal assistance which is becoming a competition for large companies to become the voice activated home assistant of choice. The dumb community usually communicate with different standards of sign languages which has become the backing idea of this project that is to convert these image processed sign languages into voice activated notes which could be understood by the personal assistant and made use of. The algorithm used here helps in classifying the sign languages as interpreted using a digital camera and then the algorithm converts them into text which is then converted into voice notes. It seems like voice interfaces are going to be a big part of the future of computing, Personal assistance are now ruling over the internet but is of no use when it comes to the dumb community. Thus the problem statement revolves around the idea of a camera-based sign language recognition system that would be in use for the dumb for converting sign language to text and then text to speech. Earlier, data gloves where used for getting the statistics of the hand movement which was then converted into text. It had two components mainly the flex sensors and measuring sensors. These components helped in recognizing a pattern of the hand movement. These samples are not predictive and sometimes may give false results. There is no proof of accuracy in the existing systems.

II. RELATED WORK

Human being interact each other to convey their ideas, thoughts, and experience to the people around them. But, there is some deaf mute people in the world. In pervious work [1], the idea is proposed smart glove which can be convert sign language to speech output. The glove will help in producing artificial speech which produces daily communication for speech impaired person. Compared to other gestures like body, face and head. Head and gesture plays an important role, because it express as soon as reaction of users view. The work shows flex sensor based gesture recognition module is develop to recognize English alphabet and few words and text to speech synthesizer. This is basically, data glove and microcontroller based system. Flex sensor based data glove can detect all the movement of the hand and microcontroller based system coverts some specified movement into human recognizable voice. Another work piece [2] depicts a system which would enable the dumb people to communicate with each and every one. In this system a webcam is placed in front of the physically impaired person. The physically impaired person would put his finger in front of the web camera and the webcam will capture the hand gesture and perform image processing using principle component analysis algorithm (PCA). The co-ordinates captured will be mapped with the one previously stored and accordingly exact picture from the database will be identified. Continuing in this way physically impaired person will be able to go through the entire sentence that he wants to communicate. Later on this sentence will be translated into speech so that it would be audible to everyone .All the above mentioned surveys either lack in feasibility or cost factor hence this paper is being proposed.

III. SYSTEM IMPLEMENTATION

The system architecture of Sixth Sense on Personal Assistance is designed such that one can provide custom made gestures also can train standard sign gestures i.e. ISL, ASL etc. The datasets being trained using the Squeez.net library with the Tensorflow. The trained datasets is being classified and predicted using the KNN classifier. The recognised or predicted output is being arranged as a query of text and is being vocally presented by the system using the speaker so that personal assistant takes the query as an input.

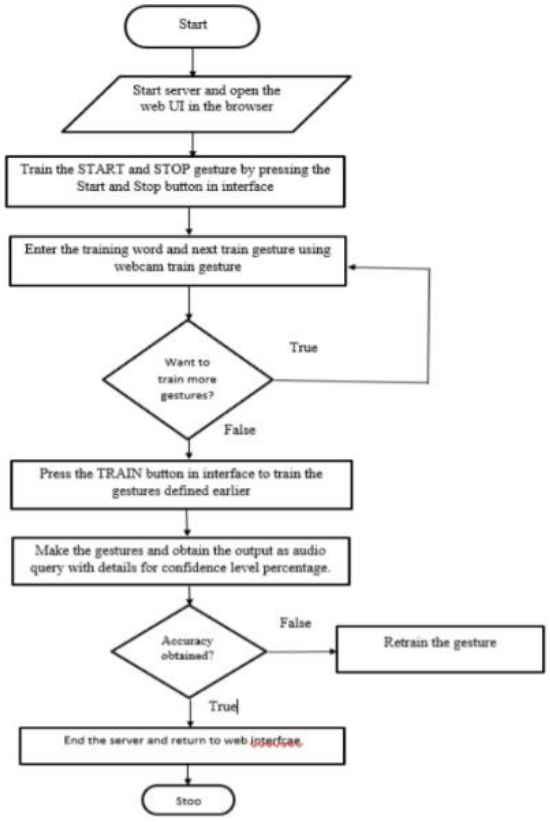

Figure 1. Flowchart for Sixth Sense on Personal Assistant

Algorithm expressed in this paper defined in above flowchart states, the user has to start the server and load the web interface from any standard browsers. Later on user should provide gesture for start and stop sign for query delimiter purpose. Then the system moves to training mode, where user has facility to provide custom gestures except from standard gestures and later on user can enter to prediction mode where trained model in the system will predict the gestures and build a textual query which will be feed as an

input to personal assistant. If the predicted output doesn't attain required accuracy rate then model can be retrained with more sets of data i.e. sign gestures. Lastly the personal assistant will take the textual query given by system as input and provide the audio output to user.

IV. EXPERIMENTAL RESULT

The system is being designed and following outputs have been obtained as results.

Figure 3 shows the training of start and stop gestures, which plays the role of a delimiter, telling the system that the input query is being started and ended using respective gestures at the start and end of the prediction stage.

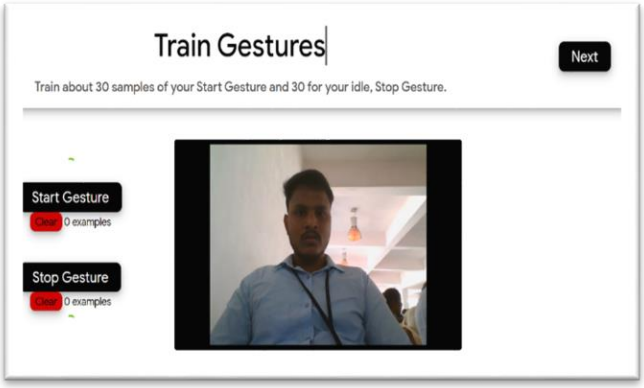

Figure 3. Initial training gesture .

The figure 4 shows the system predicting the query for already trained datasets.

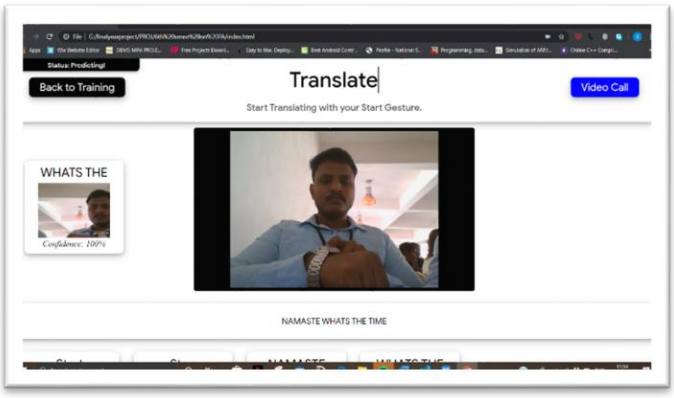

Figure 4. System prediction mode .

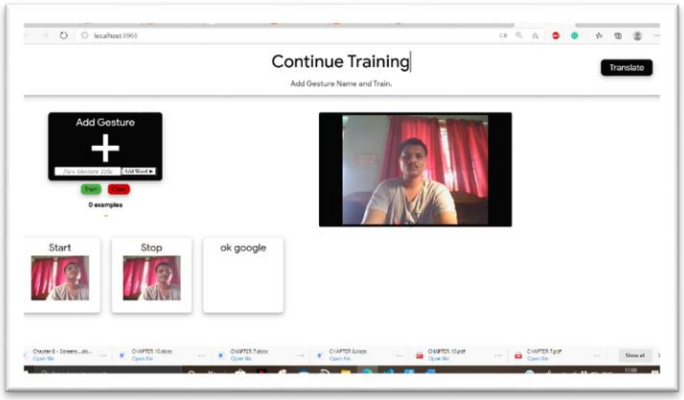

Figure 5. Custom gesture training mode.

Figure 5 shows the system providing option for custom training of datasets i.e. sign gestures.

V. CONCLUSION

The problem of physically disabled candidates is being bridged by creating a web application. The paper proposes the, web application that allows the users to interact with real world with the sign language gestures. It allows the user to train their custom made as well as standard sign language gestures to interact with the personal assistant to do the day to day tasks. It bridges the gap between the mutual communication issues caused due to lack of knowledge of sign languages to normal users. This web application results in efficient usage of time. The system helps to improve the performance. Maintaining the project is easy and manageable. It is easily understandable by the user.

VI. REFERENCES

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